

CLEAN VERSION OF AMENDED CLAIMS

1. A perpendicular magnetic recording disk comprising:

a substrate;

a laminated underlayer on the substrate, the underlayer comprising a laminate of first and second ferromagnetic layers and a nonferromagnetic spacer layer between and in contact with the two ferromagnetic layers, the two ferromagnetic layers being exchange coupled antiferromagnetically across the spacer layer, whereby the magnetic moments of the two ferromagnetic layers are antiparallel;

a layer of antiferromagnetic material between the first ferromagnetic layer and the substrate for pinning the magnetic moment of the first ferromagnetic layer in a preferred direction; and

a magnetic recording layer of material having perpendicular magnetic anisotropy on the laminated underlayer.

6. The disk of claim 5 wherein the cobalt-iron alloy includes an element selected from the group consisting of nickel, boron and copper.

15. A perpendicular magnetic recording disk having a generally circular shape and comprising:

a substrate;

a layer of antiferromagnetic material on the substrate;

3
a laminated underlayer on the layer of antiferromagnetic material, the underlayer comprising N ferromagnetic layers and N-1 nonferromagnetic spacer layers, wherein N is greater than or equal to 2, each of the spacer layers being located between and in contact with two adjacent ferromagnetic layers, a first of the N ferromagnetic layers being located on and in contact with the layer of antiferromagnetic material and having its magnetic moment pinned in a generally radial direction by being exchange biased with said antiferromagnetic material, each of the spacer layers having a thickness sufficient to induce antiferromagnetic exchange coupling across said adjacent ferromagnetic layers, whereby the magnetic moments of adjacent ferromagnetic layers are oriented generally antiparallel in the absence of an applied magnetic field, said magnetic moments being aligned in generally radial direction on the disk in the absence of an applied magnetic field; and

a magnetic recording layer of material having perpendicular magnetic anisotropy on the laminated underlayer.

26. The disk of claim 15 wherein the antiferromagnetic material is a material selected from the group consisting of FeMn, NiMn, PtMn, IrMn, PdPtMn and NiO.